



Builders Challenge

Recognizing Energy Leadership in Homebuilding

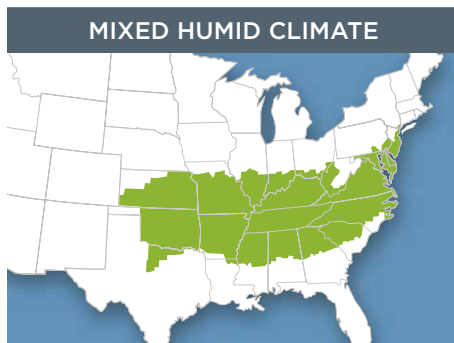
High Performance Builder Spotlight

Baldwin Homes Inc.

Arnold, Maryland

Baldwin Homes of Arnold, Maryland, built this HERS 55 Builders Challenge-certified house as an “Eco-Model” home to showcase green and energy-efficient features.

Baldwin Homes’ Eco-Model home was “built green to save green” with 69 green features and five different green certifications, including the U.S. Department of Energy’s Builders Challenge certification. Baldwin built the model home as an education center and showcase for green building features, including several that are standard in all 73 of the homes that Baldwin is building at the Preserve at Severn Run, in Gambrills, Maryland.



MIXED HUMID CLIMATE

“We wanted to create a place where potential homebuyers can see the tangible results of our philosophy of blending beauty with high performance,” said Mike Baldwin, president of Baldwin Homes. “We opened up the walls and floors so people can see how sustainable products and building methods work for them by saving money and providing a higher degree of comfort.”

The home has been certified as ENERGY STAR, National Association of Home Builders Green Building Standard Emerald level, LEED Gold, and Environments for Living Green, in addition to Builders Challenge.

BUILDER PROFILE

Builder: Baldwin Homes Inc.
www.baldwinhomes.net, Arnold, Maryland
Lisa Feeheley, Selections Coordinator
Lisa@baldwinhomes.net, (410) 544-2200

Year Founded: 1999

Homes Built: 20 per yr, 14 in 2009

Size: Typical range 2,100-2,400 sq. ft.

Price Range: Typical: \$384-461,000

Featured Home: Emerson Model, Gambrills MD, completed 2/10/2010, 6,117 sq ft., two-story plus cond. basement. \$152/sq. ft.

The home is open daily for tours. Visitors can peek inside the wood-framed (2x4, 16-inch on-center) walls to see the 3.5 inches of open-cell polyurethane spray foam that fills the cavities. The exterior is covered with 0.5 inches of extruded polystyrene rigid foam insulation that serves as a sheathing and eliminates thermal bridging at the studs. A five-inch layer of spray foam also air seals and insulates rim joists. One inch of rigid foam covers basement walls. Two inches of closed-cell spray foam covers the ducts, which are located on the ceiling deck in the unconditioned attic. Spray foam plus blown cellulose covers the ceiling deck for R-42 insulation in flat attic areas; spray foam fills cathedral attic areas. Baldwin estimates the spray foam saves up to 50% yearly on heating and cooling costs compared to previous insulation methods it has used.

Baldwin uses panelized construction, with wall framing, floor joists, and roof trusses assembled in a factory, where waste is minimized, climate is controlled for drier components, and precision is easier to achieve.

The 6,117-ft² Eco-Model home is heated and cooled with a Lennox Sunsource 18 SEER variable-speed heat pump that is installed with its own 15-ft² roof-mounted photovoltaic solar panel. The PV panels power the heat pump; when the heat pump is not running they can power other appliances in the home or surplus power can be sent to the utility via the grid for credit.

Two tankless water heaters provide domestic hot water to the home. Hot water from one of the tankless water heaters can also be directed through coils in the furnace to provide hydronic coil backup space heat if needed.

ENERGY STAR light fixtures and ceiling fans, CFL and LED lighting, and a sun tunnel solar tube provide energy-efficient lighting.

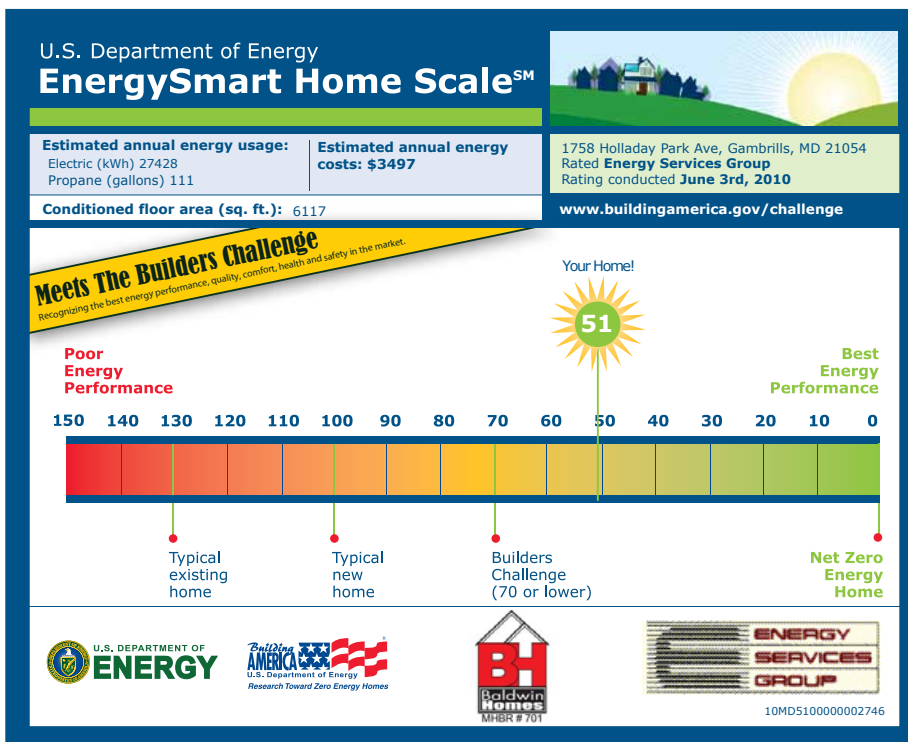
Baldwin followed the ENERGY STAR Thermal Bypass Checklist for air sealing. Healthy house features include a timer-controlled fresh air intake and MERV 16 filter on the furnace, a dehumidifier, a garage exhaust fan, a passive radon mitigation system with a vent stack that starts in the gravel under the slab and vents at the roof, a sealed-gas fireplace, low-VOC products, and carbon monoxide detectors.



The walls, ceilings, and rim joists are insulated with spray foam, which provides insulating and air sealing properties.

U.S. Department of Energy Builders Challenge

DOE seeks to give every consumer the opportunity to buy a cost-neutral, net-zero energy home anywhere in the U.S. by 2030. Homes that qualify for this Builders Challenge must achieve a 70 or less on the EnergySmart Home Scale (E-Scale) which is based on the Home Energy Rating System (HERS) index (www.natresnet.org). The E-Scale allows homebuyers to understand—at a glance—how the energy performance of a particular home compares with others.



To learn more about the Builders Challenge and find tools to help market your homes, visit www.buildingamerica.gov/challenge.

Key Features

- **HERS Score:** 55
- **HVAC:** 18 SEER, variable speed heat pump, with photovoltaic panels. MERV 16 filter on air handler
- **Water Heating:** Tankless propane
 - Duct Air Leakage:** 135 cfm to exterior at 25 Pascals
- **Blower Door Air Leakage:** 2,790 cfm at 50 Pascals
- **Basement:** Precast concrete wall with 1-inch R-12.5 rigid insulation
 - Walls:** 2x4 16-inch on-center; 0.5-inch (R-3) rigid foam sheathing, plus 3.5 inches (R-13) polyurethane spray foam in cavities
- **Rim Joists:** 5 inches (R-18) polyurethane spray foam
- **Air Sealing:** To ENERGY STAR Thermal Bypass Checklist
- **Attic:** 2 inches closed cell foam over ducts and on flat ceiling deck, plus 16 inches, (R-42) blown cellulose; R-18 spray foam in cathedral ceiling; raised heel trusses
- **Windows:** ENERGY STAR vinyl-framed, gas filled, U=0.30, SHGC=0.22 on SW and NW; U=0.34 SHGC=0.31 on NE and SE
- **Appliances:** ENERGY STAR refrigerator, clothes washer, dishwasher, freezer
- **Lighting:** 41 CFLs, 20 LED, 5 sun tunnels